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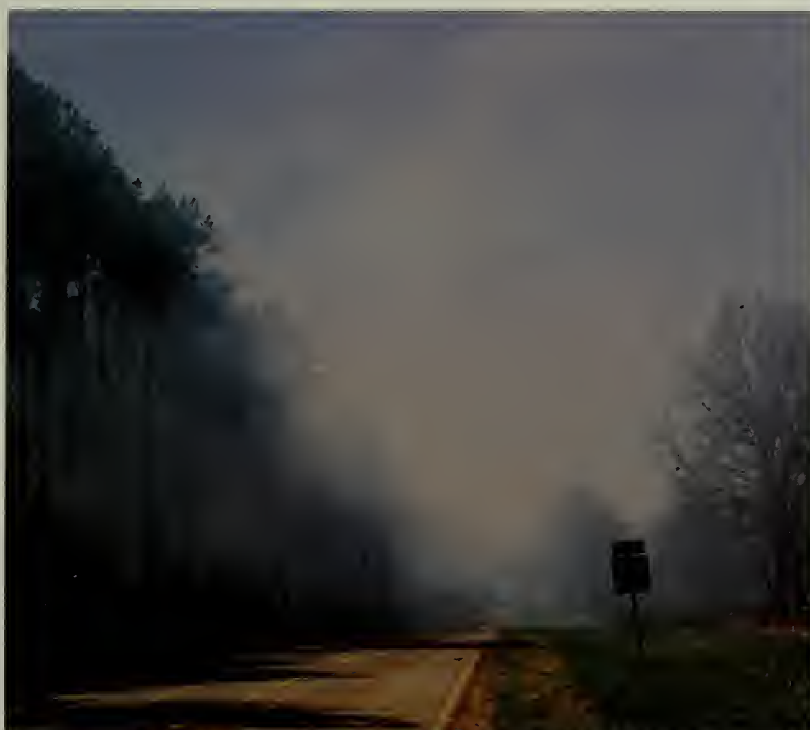

USE OF GENERAL WEATHER AND DISPERSION INDEX TO MINIMIZE THE IMPACT OF SMOKE ON HIGHWAY VISIBILITY

By:
James T. Paul, Leonidas G. Lavdas, and Wesley Wells

RESEARCH DIVISION

GEORGIA FORESTRY COMMISSION

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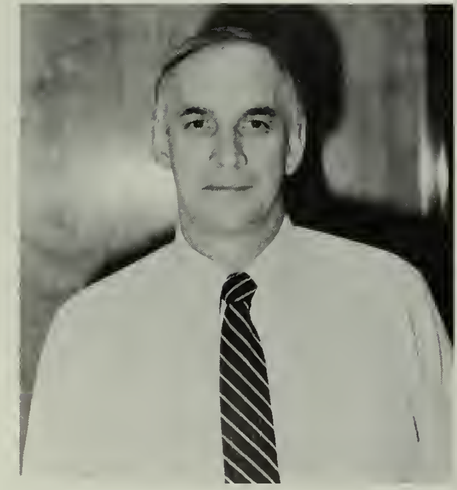

Wesley L. Wells, Jr. is Chief of the Forest Protection Department of the Georgia Forestry Commission. He received a B. S. Degree in Forestry from the University of Georgia in 1966. Wesley was employed by the Georgia Forestry Commission in 1966 and has held various positions with the organization since that time. In 1982 he was promoted to Associate Chief of Forest Protection. His primary duty was to coordinate the forest fire danger measurement system, the fire weather forecast program, and weather related research statewide. He worked closely with National Weather Service and U. S. Forest Service personnel to ensure that Georgia received the highest quality weather products. As Chief of the Forest Protection Department, he continues to monitor the fire danger measurement system and fire weather forecast system for the State of Georgia.

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Abstract

Cloud amount, nighttime temperature change, relative humidity, wind speed, moisture sources, and particulates influence the likelihood of fog formation and reduced visibility. Wind, relative humidity and fog are related at Savannah and Valdosta, Georgia. Basic weather forecasts and a dispersion index can be used to minimize the impact of smoke on highway visibility.

There are hundreds of accidents in the South each year in which smoke from prescribed fire is a major cause. For example, smoke or smoke combined with fog was the primary cause of 10 accidents in Florida during January of 1981. These accidents are usually attributed to smoke from prescribed fires, but in some cases, the smoke sources may be wildfires. The Southern Forestry Smoke Management Guidebook (1976) was developed to provide foresters with an aid for managing smoke from flaming combustion. It was recognized, but not addressed at that time, that smoke from smoldering stumps, logs, and other partially burned debris could combine with high humidity to produce very low visibility. The physical and chemical relationships between water vapor and wood smoke are complex and not sufficiently understood to provide complete field guidelines. However, very safe and very unsafe burning periods can be identified by using a recently developed dispersion index (Lavdas 1986) and an estimate of fog potential available from the daily forecast. The middle ground between safe and unsafe is large because knowledge is lacking on how the complex variables interact. Future research will be directed toward better definition of the middle ground between safe and unsafe.

FOG AND SMOKE

Fog is a low cloud that restricts visibility at ground level. Once fog has formed, it is unlikely to dissipate if relative humidity remains at or near 100 percent. Relative humidity is the single most important weather variable influencing fog formation and persistence. However, weather variables are interdependent, and a change in one usually affects others. The following is a description of how individual weather elements influence fog formation.

The Influence of Temperature

Temperature, in itself, does not affect fog. However, the amount of water vapor the atmosphere can hold before condensation occurs is affected by temperature. The colder the atmosphere, the less water vapor that can be held. Hence, if the amount of atmospheric moisture remains constant, fog may eventually form in a cooling atmosphere. Atmospheric moisture is usually quite constant during fair, settled weather regimes. At low wind speeds, the decline in temperature of the earth's surface is the major reason for declining air temperature at night when the skies are clear and wind speed is low. (For this discussion, low wind speed is defined as less than 7 mph).

The earth's surface is continually losing heat by long-wave radiation. On clear days, the magnitude of incoming short-wave energy from the sun is greater than the outgoing long-wave energy from the earth, and the temperature of the earth's surface cools. Hence, the term "radiational cooling." As the air closest to the ground cools and becomes more dense, a stable layer of air is created. Radiational cooling can result in fog formation if the atmosphere cools to the point at which it can no longer hold all its moisture in a vapor form--if it cools to its dew point. These radiational fogs are the most common type that occur during fair weather in Georgia.

- ***Positive factor for fog formation--cooling temperatures.***

- ***Negative factor for fog formation--warming temperatures.***

The Influence of Clouds

Cloud cover does not affect fog formation directly, but it profoundly affects the rate of radiational cooling. Clouds contribute to fog formation largely through their influence on temperature and hence relative humidity. On a typical night with clear skies and light winds, the dry bulb temperature will usually drop 2 to 3°F per hour for 3 to 6 hours after sunset (figure 1). Although the air temperature is dropping rapidly, the amount of water in the atmosphere usually does not change significantly. The rate of cooling slows as the dry bulb temperature approaches the dew point (relative humidity of 100 percent; dry bulb and dew point temperatures are equal). The temperature usually changes very little after the initial period of rapid cooling. Radiational cooling begins around sunset and continues throughout the night. This process is more rapid on clear nights. Clouds trap radiation, thus slowing the process (figure 1).

- ***Positive factor for fog formation--clear skies and a rapid drop in temperature after sundown.***

- ***Negative factor for fog formation--cloudy skies and slow change in temperature.***

The Influence of Wind

Wind, like air temperature and clouds, does not directly influence fog formation. However, high wind speeds mechanically mix the air in the lower atmosphere, causing the effects of radiational cooling to be spread over a much deeper layer of the atmosphere than when the wind is calm. Hence, radiation fog is more likely to form when the wind is light or calm, and is unlikely to form when wind speeds are moderate or high. The onset of moderate or high winds can disperse fog if warmer, drier air reaches the ground and causes the fog droplets to evaporate.

Fog can also move into an area on certain kinds of air flows. These events are called advection fogs. They may form in a nearby location (such as over the Atlantic Ocean) and be blown in with the wind. Another cause of advection fog is warm, moist air from the Atlantic and Gulf of Mexico coming in contact with colder land surfaces (or a cold air mass) and losing enough of its heat to reach saturation. These fogs occur mainly in autumn and winter.

- ***Positive factor for fog formation--low or calm winds.***

- ***Negative factor for fog formation--moderate to high winds.***

The Influence of Moisture Sources

In the processes described thus far, high humidity is created by cooling the air to saturation temperature. High humidity can also be created by adding water vapor to the atmosphere. When precipitation passes through unsaturated surface air, evaporation from water drops increases the humidity of the surface air. The relative humidity of air with a sustained trajectory over the Gulf of Mexico or the Atlantic Ocean will eventually approach 100 percent. Lakes, ponds, and streams have a similar though less pronounced impact on atmospheric moisture. All open water acts as a source of atmospheric moisture, with the larger bodies being more important.

A special case is a creek or river over which air remains stationary or drifts slowly downstream. This air picks up moisture as though it had passed over a considerably larger body of water. This process may be especially significant since many auto accidents attributed to fog/smoke have occurred near bridges.

Small farm ponds an acre or two in size are unlikely to add enough moisture to be of concern. Larger expanses of open water such as Lake Lanier could add enough moisture to the air to produce significant local differences.

- ***Positive factor for fog formation--wind trajectory over water.***

- ***Negative factor for fog formation--wind trajectory over land.***

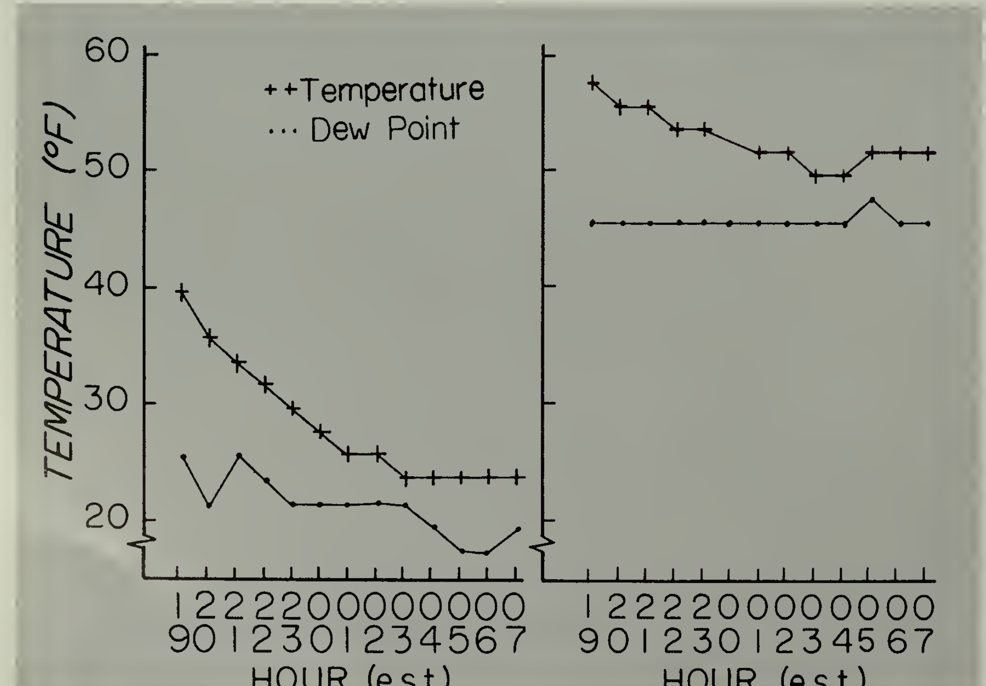


Figure 1.--Changes in nighttime temperature and dew point at Savannah, Georgia. Left: January 11, 1959. The sky was clear and windspeed was low or calm. Right: December 6, 1959. The sky was overcast, and windspeed was low or calm.

The Influence of Particles

The process of fog (or any cloud) formation is the conversion of some of the water vapor in the atmosphere into fine liquid droplets that remain suspended in the air. These water droplets are the right size to scatter light and cause a reduction in visibility. Water vapor can condense into a liquid fog droplet only with the aid of a compatible small particle already suspended in the atmosphere. Such particles are referred to as condensation nuclei. Naturally occurring condensation nuclei include dust, pollen, and salt particles from sea spray. Man's activities add to the array of available condensation nuclei. Along with industrial and automobile pollutants, smoke particles from agricultural burning, wildfire, and prescribed fires can act as condensation nuclei for fog formation. Chapter 2 of the Southern Forestry Smoke Management Guidebook (1976) describes some of the wide variety of the particles in smoke. This variety in forestry smoke and in ambient atmospheric particles contributes to the extreme complexity of the process.

To demonstrate the impact of smoke particles on fog formation, weather data for Hunter Field near the southern city limits of Savannah, Georgia, and Travis Municipal Airport about 10 miles west of Savannah were searched for days when the atmosphere was approximately the same at both locations. A north wind advects smoke to Hunter from the city; an easterly wind advects smoke to Travis. The source of this smoke is the industrial complex in Savannah which is largely concentrated along the Savannah River. It is not forestry smoke, but will serve to demonstrate the potential impact of such smoke. On January 27, 1960, (Table 1) there was an easterly wind at both locations, but smoke and fog were only observed at Travis. The minimum visibility of 3/4 mile at Travis versus the 10 miles at Hunter reflects the influence of smoke on fog formation. On January 3, 1955, there was a north wind at both locations (the wind at Hunter was usually calm, but an occasional observation that night indicated a north wind). Fog and a minimum visibility of 4 miles was observed at Travis Field, while Hunter observed both fog and smoke and a minimum visibility of 1 mile. In these two examples, the addition of smoke was the apparent cause of the lower visibility.

- ***Positive factor for fog formation--presence of smoke.***
- ***Negative factor for fog formation--no smoke.***

Table 1. Weather, Fog, and Smoke Relationships

	January 27, 1960		January 3, 1955	
	Savannah	Hunter	Savannah	Hunter
Maximum Relative Humidity (Percent)	94	96	93	87
Average Wind Speed (MPH)	5	1	4	Calm
Average Wind Direction	ESE	E	N	Calm
Fog	Yes	No	Yes	Yes
Smoke	Yes	No	No	Yes
Minimum Visibility (Miles)	3/4	10	4	1

Annual Fog Occurrence

In most of the South, the frequency of fog is least during the summer and usually greatest during fall and winter. Figures 2 and 3 show the annual frequency of 3-mile and quarter-mile fog frequencies on days with no precipitation at Savannah and Valdosta, Georgia. This distribution might suggest a management strategy of burning piled debris during the summer. However, average 0700 EST relative humidity is higher during the summer (figure 4), and wind speed is lower at 0700 EST (figure 5).

With higher humidity and lower wind speed, the probability of fog occurring would be enhanced if smoke particles were added to the atmosphere. Consequently, one should not assume that summer is the best time to burn pile debris solely on the basis of reported fog frequencies.

On a long-term basis, there will be more good days for burning in the spring where smoke would make a minimal contribution to lowered visibility. However, there is substantial variability from year to year, and in any year there are likely to be good days in any month that would be acceptable.

Interaction of Weather Variables with Fog and Smoke

Fog prediction is easiest when atmospheric indicators overwhelmingly favor fog formation. An example is a clear night with very high humidity and light winds or very favorable advection conditions. Often, there is no simple way to tell whether fog formation will occur by examining weather data. A late night relative humidity of 100 percent is common and simply indicates a saturated atmosphere relative to a flat water surface. Condensation upon a sharply curved surface, such as a water droplet, is more complex and difficult to predict. The nature of the condensation nucleus and the presence of impurities in the water droplet can make condensation considerably easier. Fog can form when the observed relative humidity is under 100 percent, and fog forms more easily when smoke is present. An examination of weather records at Savannah, Georgia, revealed fogs reducing visibilities below 1 mile occurred when reported relative humidity was about 95 percent, and in one case, when humidity was 86 percent (Lavdas 1974). Likewise, the previous example in Table 1 showed a relative humidity of 87 percent with 1 mile visibility at Hunter on January 3, 1955.

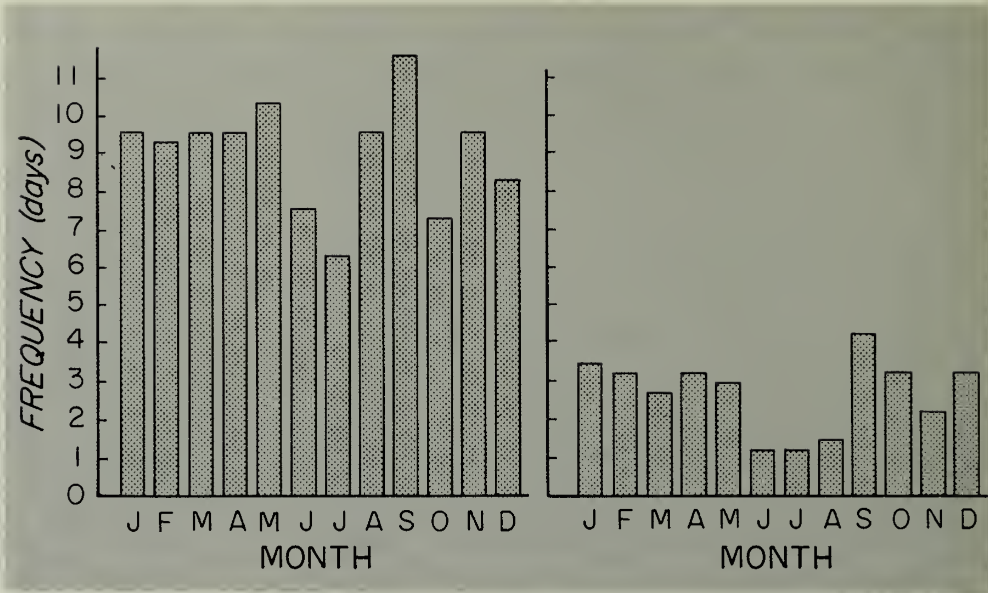


Figure 2.-- Average numbers of days per month at Savannah, Georgia, when the visibility was 3 miles or less (left) and 1/4 miles or less (right). Days with rain are excluded.

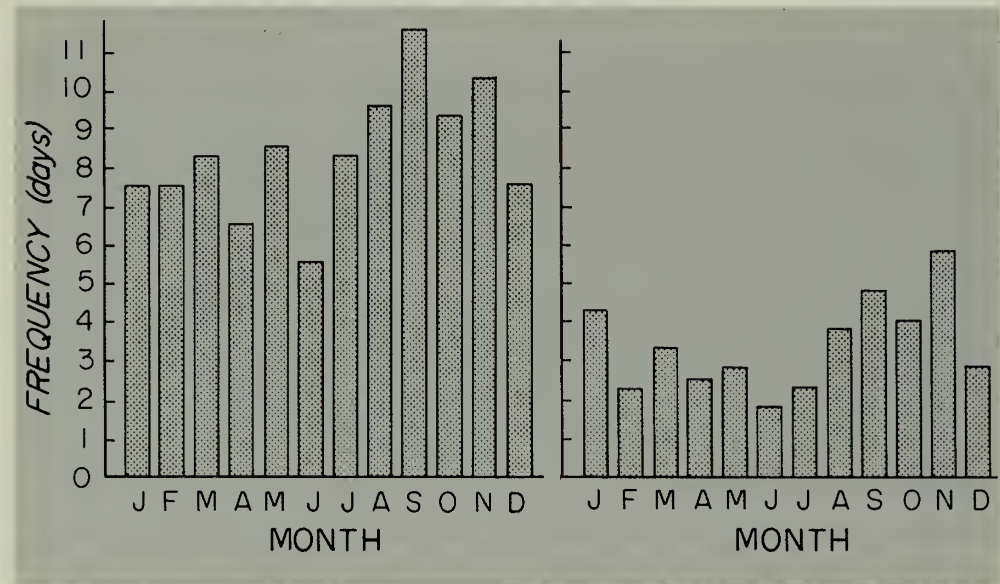


Figure 3.-- Average numbers of days per month at Valdosta, Georgia, when the visibility was 3 miles or less (left) and 1/4 miles or less (right). Days with rain are excluded.

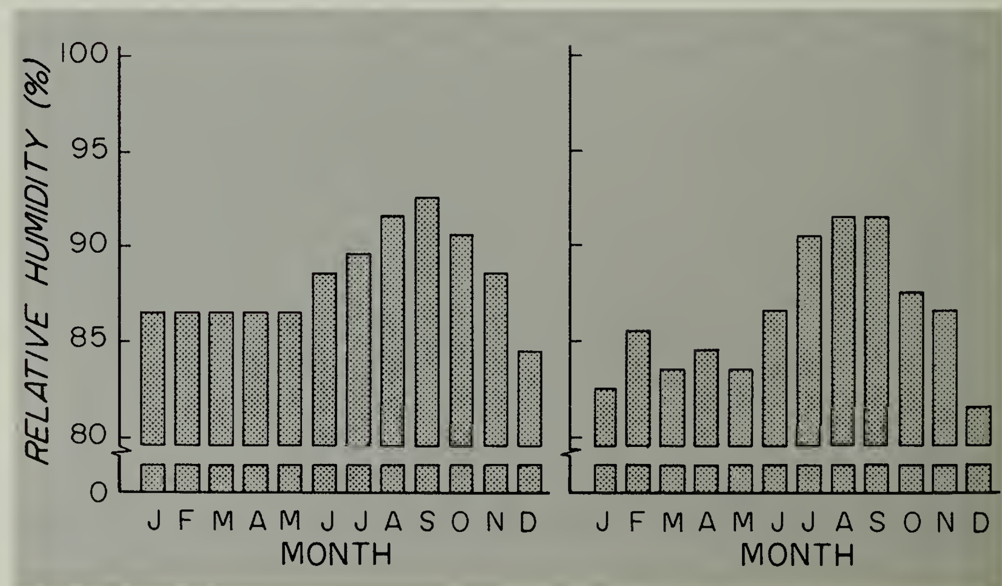
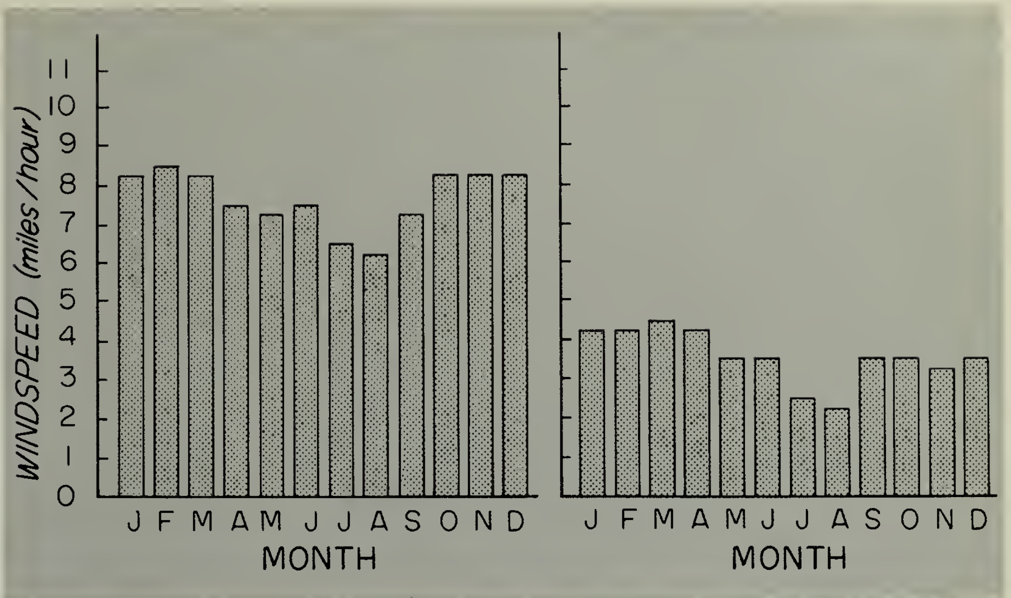


Figure 4.-- Monthly average relative humidity at 0700 EST at Savannah, Georgia, (left) and Valdosta, Georgia (right). Period of record, 1954 to 1963.

Figure 5.-- Monthly average windspeeds at 0700 EST at Savannah, Georgia, (left) and Valdosta, Georgia (right). Period of record, 1954 to 1963.



Fog forms in a stable atmosphere in which a build-up of smoke concentration is very likely. One must assume, therefore, that perceptible quantities of smoke coming from a fire site on a night with unfavorable conditions for dispersion will create or worsen visibility hazards. Although wind speeds during fog-prone conditions are low, smoke can drift a considerable distance down a drainage during the night and maintain high concentrations. Because of the potential for high smoke concentrations and the uncertainties associated with fog formation, it is perhaps best to regard visibility hazards in smoke as a risk. Where a highway is nearby, the optimal strategy is to reduce or eliminate the risk.

There are three basic fog-related issues one should attempt to answer when planning a prescribed fire:

1. Is natural fog likely to occur?
2. What is the probability that smoke from my fire will drift into a high fog area that is sensitive to reduced visibility?
3. Given 1 and 2 above, what is the magnitude of the visibility reduction that could be attributed to smoke?

Issue one can be answered within the limits of weather forecasting accuracy. Issue two can be partially answered by examining the forecast wind direction and evaluating the location of the burn with respect to roads. Since current knowledge is limited, if smoke is to be advected into an area where fog has already formed or is forecast to form, one should assume the worse case--that smoke will reduce visibility to near zero. The third issue cannot be directly evaluated given our current state of knowledge. To be on the safe side, prescribed burns where the nighttime forecast humidity is greater than 70 percent should be attempted with extra caution, and it should be kept in mind that the higher the relative humidity, the greater the risk of low visibility in smoke.

HOW DISPERSION INDEX IS SIMILAR TO THE GUIDEBOOK SCREENING SYSTEM

The dispersion index was developed after the Smoke Management Guidebook was published. It contains similar but more complete information than the simple smoke management screening system.

Dispersion index is not designed to predict smoke concentrations from a fire, but to indicate the atmosphere's capability to disperse smoke from an area of burning activity (of about 1,000 square miles) to acceptably low concentrations at the downwind edge of the area. The typical situation is for single fire concentrations to be lower when dispersion index is higher. Often, a doubling of the index will cut single-fire smoke concentrations by more than half. Occasionally, concentrations may actually increase at a specific location as dispersion index values rise. Strong winds, for example, raise the dispersion index, but may keep a smoke column close to the ground. Only complex single-fire screening methods have the capability to predict smoke concentrations from a fire with reasonable accuracy.

HOW DISPERSION INDEX IMPROVES UPON THE GUIDEBOOK SCREENING SYSTEM

The dispersion index takes into account more meteorological information than does simple screening. With experience, it can be used as a refinement to the Guidebook procedure. Dispersion index integrates transport wind speed, mixing height, and stability class into a single number. Simple screening in the Guidebook considers transport wind speed and mixing height individually, and indirectly considers stability class for night burning only. Recommendations against burning will be in effect whenever the dispersion index shows a value of 1 and will usually be in effect when index values range from 2 to 6. Note that dispersion index values of 1 to 6 are designated "Very poor." The Guidebook recommends against burning when transport wind speed is less than 4 m/sec or when mixing height is less than 500 m. Avoiding both of these conditions during the period from mid-morning to just before sunset guarantees a dispersion index value of at least 16. Widely ranging index values are possible when only the mixing height is too low or when only the transport wind speed is too low. Extreme caution in smoke management is recommended whenever the Guidebook recommends against burning. The same is true whenever dispersion index values are 20 or less (Very poor, Poor, or Generally poor categories). The need for caution varies with the individual situation. Low mixing height indicates low plume heights, low transport wind speeds indicate poor plume dilution, and low dispersion index values indicate smoke pollution buildup over an area with an increased probability of smoke problems from individual fires.

USING DISPERSION INDEX TO EVALUATE VISIBILITY HAZARD

Dispersion index and relative humidity must both be considered when evaluating potential visibility hazard due to smoke.

Dispersion index is expressed as a positive number--the higher the number, the better the weather conditions for dispersing smoke. An index value of 60 is twice as effective as a value of 30 and is half as effective as a value of 120. Table 2 gives an interpretation of dispersion index values for smoke concentration management purposes. One should note that the scale has no upper limit. Values considerably above 100 are possible in exceptionally windy conditions. The table is preliminary and the tabular "break-points" are arbitrary. For example, there is actually very little difference in dispersion between index values of 60 and 61, but the difference between 50 and 75 can be significant, and the difference between 10 and 100 is very significant.

Dispersion index is computed from atmospheric stability (near the ground as Turner stability class[1], aloft as the mixing height) and the average wind speed in the layer of atmosphere expected to contain smoke. It responds quickly to changes in atmospheric conditions and does describe diurnal variations in weather. Daylight values can be directly compared to nighttime values.

On a typical day, dispersion index responds in somewhat the same manner as temperature. During the morning and through noon, it usually climbs steadily from its low nighttime value. It reaches its maximum in early afternoon and maintains this value until shortly before sunset. Around sunset, the drop in dispersion index is much more rapid than that of temperature. As the temperature drops during sunset, dispersion index has already reached its low nighttime value, which it maintains throughout the night.

Dispersion index should not be used to directly predict smoke concentrations immediately downwind of a fire. Smoke dispersion models for individual fires should be used for this purpose. One should note that it is possible to overload the atmosphere locally, no matter how good the dispersion.

Relative humidity is a critically important parameter for evaluating potential visibility hazard. A relative humidity at or above 70 percent indicates that a given concentration of smoke will restrict visibility more severely than in dry conditions. Relative humidities in the 80's and 90's may be associated with smoke-induced fog formation and visibility hazards, while natural fog often occurs when the relative humidity is in the 90's as well as at 100 percent.

Dispersion index does not consider relative humidity or the effect of smoke on visibility. As relative humidity climbs, the effect of a given concentration of smoke on visibility becomes more severe. Smoke can cause or contribute to fog formation. It greatly increases visibility hazards in existing fog.

To some extent, however, the dispersion index value will be related to fog formation. A certain amount of wind and a neutral or unstable atmosphere are necessary to produce high index values. These weather conditions also inhibit fog formation. Low index values will be associated with fog, but a low dispersion index does not guarantee that fog will occur.

The combination of low dispersion index values and high relative humidity indicates an extremely high risk of visibility hazards. Under such weather conditions, low visibility due to the presence of smoke and the occurrence of fog, possibly induced by smoke, is very likely.

Table 2. Preliminary Interpretation of Dispersion Index Values

Dispersion Index	Interpretation
Greater than 100	Very Good; may indirectly indicate hazardous conditions; check fire weather
61-100	Good; typical burning weather parameters are in this range
41-60	Generally good; climatological afternoon values in most inland forested areas of the U. S. fall in this range
21-40	Fair; stagnation may be indicated if accompanied by persistent low wind speeds
13-20	Generally poor; stagnation if value persists during day; better than average for a night value
7-12	Poor; stagnant during the day but near or above average at night
1-6	Very poor; very frequent at night; represents the majority of nights in many locations

[1]The Turner Stability Class is an empirical method of estimating thermal stability of the lower atmosphere based on cloud amount, ceiling height, surface wind speed, and solar observation angle.

USING THE WEATHER FORECAST TO MINIMIZE THE IMPACT OF SMOKE ON HIGHWAY VISIBILITY

There are two products available for use in highway visibility management. The first is the English text, Georgia Forestry Commission District Forecasts, based on National Weather Service inputs. The second is GAAQVALS, which is a Forestry Weather Interpretation System (FWIS) interpretive product. These two products used together represent the current state of the science and art of forestry smoke and highway visibility management.

November 12, 1986 - A Good Day for Smoke Management

Good prescribed burning and good management days were rare during the fall of 1986 largely due to an unusually wet season. November 12 was a good day for smoke management, but in those areas where it rained, it was not a good day for prescribed burning. The forecast for GFC Districts 5, 7, and 9 - North is included here to demonstrate how dispersion index, relative humidity, wind and cloud cover can be used as an aid in highway visibility management.

Since nighttime is the critical period, one should examine the nighttime weather and evaluate the proximity of a burn to highways or other areas that are sensitive to reduced visibility. Recall from the previous discussion that high winds, low humidity, clouds, and high dispersion index are negative factors for fog formation. The forecast calls for a high humidity of 70 percent, mostly cloudy skies, a north wind of 18 MPH, and a dispersion index of 38 (FAIR). Fog formation under these conditions is very unlikely, and one would be safe in burning under all but the most unusual conditions.

GEORGIA FORESTRY DISTRICT FORECASTS
NATIONAL WEATHER SERVICE ATLANTA GA.
8:00 AM EST. WED. NOV. 12 1986

SYNOPSIS....
VERY COLD AIRMASS MOVING SOUTH ACROSS THE MIDWEST STATES WILL REACH GEORGIA TONIGHT.

DISTRICTS 7,5,9-NORTH

TODAY..Mostly cloudy with a 30 percent chance of showers. Precipitation duration two hours with amounts around a tenth of an inch. High in the upper 60's. Low relative humidity 55 percent. Northeast wind 10 MPH.

TONIGHT..Mostly cloudy with a 30 percent chance of showers. Precipitation duration around one hour with amounts around a tenth of an inch. Low near 50. High relative humidity 70 percent. North wind 18 MPH.

THURSDAY..Partly cloudy. High in the mid 50's. Low relative humidity 55 percent. North wind 22 MPH and gusty.

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GAAQVALS - A FWIS INTERPRETIVE PRODUCT PROVIDING GEORGIA AIR QUALITY VALUES. (NOT A NATIONAL WEATHER SERVICE PRODUCT)

PRODUCT ISSUED AT 801 AM EST NOV 12 1986 **rel 1.4**

CAUTION******FAVORABLE DISPERSION CONDITIONS ARE **NOT** TO BE USED ALONE IN DECIDING TO INITIATE PRESCRIBED BURNING.

DISTRICTS 7,5,9 -NORTH

	TODAY	TONIGHT	THURSDAY
SMOKE DISP. INDEX	37	38	85
SMOKE DISP. ADJECTIVE	FAIR	FAIR	GOOD
TURNER STABILITY	4	4	4
ATMOSPHERIC TENDENCY TO PROMOTE FIRE BEHAVIOR	NORMAL	NORMAL	NORMAL
SFC WIND DIRECTION	NORTHEAST	NORTH	NORTH
SFC WIND SPD (OPEN)	10 MPH	18 MPH	22MPH
TRANS WIND SPEED	6	12	14
MIXING HEIGHT (M)	1365	965	1365
PLUME TRAJECTORY	SOUTHWEST	SOUTH	SOUTH

October 29, 1986 - A Very Poor Day for Smoke Management

The forecast weather for the night of October 29 is for partly cloudy, high humidity 95 percent, light and variable winds and a dispersion index of 1 (very poor). Additionally, the remarks section warns of smoke entrapment and reduced visibilities. In this case, one should not burn if there are heavily traveled highways or other targets that are sensitive to reduced visibility near the burn. If the proposed burn is in a remote area where human activity is minimal, visibility considerations may be of minor concern, but attention may need to be given to the possibility of adding smoke to an atmosphere that may already be polluted and unable to purge itself.

CONCLUSIONS

The examples of November 12 and October 29 represent the two extremes. Most days and nights will resemble the October 29 case, since high nighttime humidities are usually present throughout the South.

A logical question for a forest manager is: "What does this mean to my operation?" In the absence of any published data, we have estimated that following the guidelines described in this paper may reduce or delay burning near visibility-sensitive areas. Considering the alternative, postponing burning until conditions are acceptable is not a high price to pay. The alternative is to ignore visibility management and risk responsibility for highway fatalities. If that course is followed, there is a high probability that prescribed burning may be regulated by legislative proclamation.

The reduced days available for burning may be partially compensated for by aerial ignition techniques, which make it possible to burn large acreage and have many fires on the few days when conditions are acceptable. Also, as we learn more about the effects of smoke on fog formation, it may be possible to safely burn on days which we now regard as marginal.

GEORGIA FORESTRY DISTRICT FORECASTS
NATIONAL WEATHER SERVICE ATLANTA GA.
741 AM EST. WED. OCT. 29 1986

SYNOPSIS....
HIGH PRESSURE OVER MOST OF THE SOUTHEAST U.S. A WEAK WAVE HAS FORMED ALONG THE SOUTHEAST GEORGIA COAST ALONG AN OLD FRONTAL BOUNDARY PUSHING CLOUDS INTO GEORGIA.

DISTRICTS 7, 5, 6

TODAY..Partly cloudy. High in the mid 70's. Low relative humidity 40 percent. Light and variable wind.

TONIGHT..Partly cloudy. Low in the lower 50,s. High relative humidity 95 percent. Light and variable wind.

THURSDAY..Partly cloudy. High in the mid 70's. Low relative humidity 45 percent. Northeast wind 5 MPH.

****

GAAQVALS - A FWIS INTERPRETIVE PRODUCT PROVIDING GEORGIA AIR QUALITY VALUES. (NOT A NATIONAL WEATHER SERVICE PRODUCT)

PRODUCT ISSUED AT 742 AM EST OCT 29 1986 **rel 2.4**

CAUTION******FAVORABLE DISPERSION CONDITIONS ARE **NOT** TO BE USED ALONE IN DECIDING TO INITIATE PRESCRIBED BURNING.

DISTRICTS 7,5,6

	TODAY	TONIGHT	THURSDAY
SMOKE DISP. INDEX	19	1	38
SMOKE DISP. ADJECTIVE	GENERALLY POOR	VERY POOR	FAIR
TURNER STABILITY	1	6	2
ATMOSPHERIC TENDENCY TO PROMOTE FIRE BEHAVIOR	ERRATIC	NORMAL	INTENSE
SFC WIND DIRECTION	LT AND VARIABLE	LT AND VARIABLE	NORTHEAST
SFC WIND SPD (OPEN)			
TRANS WIND SPEED	1	1	3
MIXING HEIGHT (M)	2133	761	1962
PLUME TRAJECTORY	VARIABLE	VARIABLE	SOUTHWEST

REMARKS...
A COMBINATION OF LIGHT WINDS AND HUMIDITIES OF 90 PERCENT OR GREATER LATE TONIGHT AND EARLY TOMORROW MAY CAUSE SMOKE ENTRAPMENT AND REDUCED VISIBILITIES UNTIL AROUND 9 AM EST TOMORROW.

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GEORGIA FORESTRY COMMISSION

John W. Mixon, Director
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